# The Role of Education in Attracting Young People as the Next Generation of Aviators: The Differences between Women and Men Students

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# The Role of Education in Attracting Young People as the Next Generation of Aviators: The Differences between Women and Men Students

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**Abstract**

Lack of awareness of aviation careers among younger generations and the continued male dominance of the aviation and aerospace industries have contributed to a complex workforce shortage. The lack of female representation at top decision-making positions (e.g. C-suite holders), creates a dearth of role models for younger women interested in aviation and aerospace professions, which may discourage them from pursuing careers in this field. By revitalizing interest in aviation among the younger generation and embracing diversity, the aviation industry can pave the way for a more sustainable future. Contemporary research suggests that early exposure to aviation and aerospace careers is key to attracting young women to aviation and aerospace opportunities.

This study focuses on the different motivational factors that influence youth to pursue aviation technology related careers. Specifically, the researchers focus on the differences between women and men. The aim of the study is to gain insight into what attracts women to careers in aviation. Understanding these differences is important as aviation is a male dominated industry and there is ongoing advocacy to increase participation of women in aviation industry. Previous studies have focused on professional female pilots. In addition to pilots, this study will include students pursuing careers in aviation maintenance, management, and unmanned aircraft systems. Study participants are undergraduate students currently enrolled in one of the largest aviation technology programs in the country. This study contributes to the body of knowledge on workforce diversity in aviation and aerospace education and approaches to improve the pipeline for the aviation and aerospace sector workforce.

Several themes were identified through thematic analyses. The outcomes of this research provide valuable insights into developing effective recruitment strategies to enhance diversity in aviation and aerospace collegiate programs. Moreover, understanding the choices of college students will broaden and strengthen the pipeline of graduates, thereby contributing positively to the challenge of developing a diverse and robust industry workforce.

**Keywords:** Aviation Education, Collegiate Aviation, Aviation Maintenance, Professional Flight Technology, Aviation Management, Mentorship

## Introduction

The lack of all forms of diversity in the aviation and aerospace industry is a concern for many stakeholders. The marginal representation of women in various aviation and aerospace careers has been addressed in previous studies [1], [2], [3]. Women are underrepresented across all levels of aviation careers starting from young female aviators in collegiate programs and at the C-Suite level where women represent only 6% of airline chief executive officers (CEOs) in the top 100 airlines globally [4].

This phenomenon has its own inherent implications but is of particular concern during times of rapid growth in the aviation industry. In their 2023 report, Boeing projected that over the next 20 years, 649,000 new pilots, 690,000 new maintenance technicians, and 938,000 new cabin crew members will be needed to meet global demand [13]. Recent industry developments include new airlines being announced in emerging economies and a proliferation of companies pursuing urban air mobility, among other initiatives. Talent acquisition and management is essential to support these enterprises.

In their 2018 reauthorization of the Federal Aviation Administration (FAA), Congress mandated an advisory board be created with the mission of encouraging women and girls to enter aviation. The report by the Women in Aviation Advisory Board (WIAAB) concluded that introducing young girls to aviation careers is key to the development of the pipeline of women into future aviation careers [5]. Several career theories stress the profound impact of this introduction taking place early in the childhood development process. Nevertheless, introduction to aviation during the adolescent and teenage years is still early enough for girls to consider the field as a potential vocation and enroll in an undergraduate degree programs or other options for pursuing aviation as a career field.

This study focuses on the representation of women in collegiate aviation programs. By comparing information collected from male and female students, this study considers the common and unique factors that attract people to the field of aviation, as well as the function of role models and mentors. Understanding the representation of women in collegiate aviation will illuminate the motivations for pursuing aviation careers, particularly from an early age.

## Research Questions

Historically, diversity within the science, technology, engineering, and mathematics (STEM) fields has not kept pace with other areas. In aviation, the industry has also struggled with limited diversity. Despite recent attention and concerns raised by aviation industry stakeholders regarding the underrepresentation of women and other minority groups, the number and percentage of women in aviation professions, such as commercial pilots, maintenance technicians, and air traffic controllers, has remained very low over the past three decades [6]. For instance, between 2007 and 2021, the percentage of female air transport pilots (ATPs) increased from 3.7 percent to 4.7 percent [7]. To best understand the low participation rates of women and

other minorities in the aviation industry, it is important to explore the common factors that attract both men and women to aviation careers and unique factors that draw women into the industry. In this study, insights are provided into the body of knowledge on diversity in aviation and aerospace education and approaches to develop the pipelines for the aviation and aerospace sector workforce. To achieve this purpose, this study investigates the following two research questions (RQs):

RQ1: What are the underlying motivations driving college students to pursue degrees and careers in the aviation technology field?
RQ2: Do motivational factors differ between male and female college students when considering an aviation technology-related degree or career?

## Literature Review

The literature review provides insight from extant literature on the factors that motivate men and women to pursue aviation education and careers. An overview of the current diversity and gender challenges in the aviation industry is provided. These challenges are contextualized through career theory. In addition, literature regarding mechanisms behind individuals' attraction to aviation and aerospace, as well as documented gender discrepancies, are outlined. Finally, barriers to choosing aviation careers are discussed.

### *Diversity in the aviation workforce and gender representation*

Despite significant growth in air transport over recent decades, there has been minimal advancement in achieving diversity within the aviation workforce. The air transportation industry, beyond just airlines, exhibits limited representation of non-White and non-male employees [8]. Although the population and workforce in the United States has become more varied, racial diversity in the aviation industry still lags [9]. In 2021, the Bureau of Labor Statistics (BLS) reported the racial breakdown of pilots and flight engineers. Among this demographic, 93 percent were White, 6.1 percent were Hispanic or Latino, 3.9 percent were Black, and 1.5 percent were Asian. However, by race, Whites constituted 62.0 percent of the labor force, followed by Hispanics or Latinos at 17.2 percent, Blacks at 12.1 percent, and Asians at 6.1 percent [8].

In addition to this dynamic, there has been an even wider gender gap, a situation that has existed for years. In 2021, women accounted for 47 percent of the total employment and represented 52 percent of all workers employed in management, professional, and related occupations in the United States [8]. However, women make up less than 20 percent of most aviation occupations [6]. Key roles in which women are also significantly underrepresented include maintenance technicians at 2.6 percent, airline pilots at 5.0 percent, aerospace engineers at 11.6 percent, collegiate aviation faculty at 15.6 percent, airport managers at 16.7 percent, and air traffic controllers at 16.8 percent. In terms of growth ratios, over the past 15 years, women have made positive yet minimal gains. Various key areas have seen marginal growth, including a 1.1 percent increase among airline transport pilots, 1.3 percent among air traffic controllers, and 0.7 percent among maintenance technicians. While the aviation industry is undergoing a transition towards gender diversity, the substantial underrepresentation of women in the

workforce underscores the collective responsibility of all stakeholders to develop a more diverse, equitable, and inclusive industry for women.

*Attraction to Aviation Education and Careers*

According to the Social Cognitive Career Theory (SCCT), the career and/or academic choices of young people are affected by personal, cognitive, and contextual factors. These factors evolve gradually from childhood and primary school through adolescence and secondary school, to adulthood and university [10]. Based on SCCT, in order to understand the factors that attract young talent to the aviation sector, it is necessary to analyze how prior experience, self-efficacy, outcome expectations, as well as contextual support and barriers interact to influence academic and career interests and choices.

Firstly, a fundamental factor that contributes to prior experience is individuals' deep-seated passion for flight and aviation. Several studies found that this passion often develops at a young age and serves as a primary motivator for individuals to pursue aviation education [11], [6], [12]. One study of professional female pilots found that their decision to pursue a career in aviation happened at 18.2 years of age [14]. A replication study done with graduates from a collegiate aviation program found this number to be 15.2 years of age [15]. This underscores the importance of creating an interest in aviation at an earlier age if students are to enroll in a collegiate aviation program prior to entering the workforce.

In addition to a passion for aviation, many individuals are drawn to the industry's challenging and adventurous aspects. A study conducted by Anderson and Pucel found that a desire for a challenging career and perceiving pilots as an adventurous profession were ranked as the third and fifth influential factors among all 70 factors [11]. In recent years, Lutte found that adventure is one of the top five factors that affect the decision to pursue a career in the aviation industry [6]. Of those participants, 88 percent perceived aviation as an adventurous profession and identified it as a factor with a positive influence.

*Role Models and Mentors*

While a young person's passion for aviation can be indispensable in their decision to pursue a career in aviation, also influential in this process is the presence of a mentor or role model. Previous studies of undergraduate females suggest the greatest need for role models is for those students pursuing a nontraditional career [16]. This outlook is reflected in several aviation studies that address both recruitment and retention of female pilots. A lack of a visible female role model was cited as one of the top barriers to outreach [17] [18].

Females in aviation maintenance also experience this challenge. One study found that the top three barriers preventing women from pursuing a career in aviation maintenance are the absence of role models, mentors, and personal contacts [20]. Further, a study that investigated, in part, the appropriateness of aviation maintenance as a career for a woman, suggested that people who believed it was a suitable occupation reported doing so due to personal knowledge of female aviation maintenance professionals [21].

The significance of role models has been discussed for nearly a century, notably as part of Freud's analysis of the superego. Since then, the effectiveness of role models, and how they can be most impactful in career vocations, has been explored. While role models must be relevant figures with achievable attainments, it is helpful if they share similar demographics. In the case of gender, emulation of role-model behavior and goals can be most cognitively feasible with male-male and female-female pairings [22]. This is more of an ideal than a requirement though. One study of professional female pilots found that all participants had high regard for many of their male flight instructors and the support given by them [14].

In summary, common factors that attract individuals, regardless of gender, to pursue degrees or careers in aviation include a passion for aviation and a sense of challenge and adventure. Understanding and promoting these factors is crucial for recruitment and retention efforts within the industry. For females in particular, this message can be communicated effectively through role models and mentors.

## Research Methodology

This study employed qualitative research methodology using open ended interview questions. Direct and indirect methods of participant recruitment were used. In a previous study [1], participants in a survey study were asked if they would like to be interviewed for a future study. Those who responded in the affirmative were recruited for this study. In addition, participants were recruited by email sent to the entire population and by posting flyers in public spaces where potential participants frequent. Before participating, individuals were informed about their rights, including the voluntary nature of their participation. This study received Institutional Review Board (IRB) approval #IRB-2024-143 and IRB# 2177147.

### *Description of Participants*

The participants are undergraduate students currently enrolled in an aviation technology programs at a large Midwestern university. The program consists of four majors: Professional Flight, Aeronautical Engineering Technology, Unmanned Aircraft Systems, Aviation Management. Researchers targeted a sample size of 10 participants to be interviewed for the study using Zoom® virtual platform. To preserve participants' privacy, collected data was stored in a secure location where only authorized researchers had access to the data. All identifying information was removed from the interview transcripts before data were analyzed.

### *Interview Procedure*

The study used open-ended interview questions. Anonymous email invitations were sent to undergraduate students enrolled in the four programs being investigated. A flyer was posted around various common areas where students frequent. Eleven students responded to the emails, and eight were interviewed over two weeks. The interview questions were informed by the researchers' personal experiences as aviation professionals, interactions with students from diverse aviation majors, and consultations with aviation industry professionals. This process was further supported by a comprehensive review of existing literature on the topic.

One-on-one interviews were conducted in compliance with all IRB guidelines. The interview questions were divided into three sections: demographic information (e.g. gender, age, race, etc.), awareness and exposure, and gender-specific motivation. Each interview lasted approximately a half hour. Interviews were recorded using Zoom® recorder and transcribed using Zoom® transcription. All data were stored securely to protect participant privacy. All participant identifiable information was removed before data was analyzed.

**Results and Data Analysis**

Eight interviews were completed and analyzed. The eight interviews consisted of five male and three female participants. The demographic information for the participants were four (4) freshmen, one (1) sophomore, and three (3) juniors. The participants' majors were as follows; six (6) professional flights technology, two (2) management and three (3) aeronautical engineering technology (AET). Two participants were double majors in Professional Flight Technology (Pro-Flight) and Aviation Management (AM) and one in Pro-Flight and AET. Two participants were international students.

The interviews were conducted virtually using Zoom® platform and transcribed using Zoom® transcribe. The transcripts were stored in a safe folder per the IRB requirements and were only accessible to the research team. Transcripts were then uploaded to NVIVO® software for analysis.

Two researchers read each transcript twice to verify accuracy. The first read helped the researchers familiarize themselves with the participant responses. In the second read, the researchers developed preliminary codes (Appendix B) based on the research questions. The codes were revised to develop the final themes. The following seven themes emerged from the coding process.

*Theme 1. Motivation* for *pursuing aviation as a career*

Motivation for pursuing aviation as a career varied from participant to participant. All participants expressed being primarily influenced by personal motivation and self-drive. None of the participants interviewed had a relative or close family member working in the aviation industry. One participant said he enjoyed hearing stories from his grandfather, who had served in the United States Air Force. A common response from the participants was that they have received a lot of support from their families and friends, both before and while attending college. This support keeps them motivated during tough times when college gets challenging.

*Theme 2. Earliest exposure to aviation activities*

Commercial travel was a common response for earliest exposure to aviation. Some participants reported that they developed an interest in aviation as a career before starting high school. Other participants developed an interest during their high school years, around the college application period. The methods of exposure differed between female and male participants. Several male participants responded that the Air Force or international war stories, such as documentaries, supplemented their earliest exposure to aviation, in addition to

commercial flying. One female participant responded that her earliest activity/exposure was through a book series about an Air Force nurse. She was set on becoming an Air Force nurse before she decided to pursue a career as a pilot. The two international student participants reported that although they were interested in aviation, they did not know where to start their search. For both, a male and female student, the internet was their main source of information on how to start a career as a pilot.

The participants mentioned that the age they first became interested in aviation was within a range of 6 and 21, with the mean age being 11.3 years of age. This indicates that most participants gained an interest in aviation during the 6$^{th}$ grade in the United States.

*Theme 3. Exposure to precollege aviation programs*

Exposure to aviation programs such as membership in local Experimental Aviation Association (EAA) clubs and enrollment in ground school classes at a local airport or aviation academy were reported by both female and male students. Both male and female participants indicated that such clubs provided them an opportunity to meet and learn from experienced aviation professionals and aviation enthusiasts. This was their only source of aviation mentorship, as they were not participating in another activity that provided a source of mentorship and did not have a member of their nuclear family involved in aviation. There was no indication from participants that their high schools provided a platform to explore aviation careers. One of the female international students responded that her high school counselor did not know any females who had shown interest in aviation as a career path.

*Theme 4. Precollege mentorship and access to role models*

Participants responded that they found mentors through precollege programs such as members of the EAA clubs or flight academies they attended. Another source of mentorship shared by some participants included friends of family, flight instructors at flight academies, neighbors, and other students and acquaintances. A common occurrence was that female participants reported that all their mentors were men. One female participant reported that while she was a student pilot, she became inspired by a video of another female flight student in California. The woman in the video continued her training and is now a flight instructor.

*Theme 5. Awareness of gender issues in aviation*

Both male and female participants indicated they were familiar with the current gender imbalance in the aviation industry. Female participants were also keen on the challenges that women may encounter in pursuit of aviation careers. Some male participants indicated this was not a topic they had given much consideration. When asked how they perceive the status of gender imbalance affecting their career choices, the responses between female and male participants were notably different. For female students, the awareness of gender discrepancies made them want to work harder to achieve their goals as aviators. For male participants, they did not perceive that the gender imbalance would impact their careers as aviators.

Female participants reported challenges, including being one of the only, if not the only, women in a class, not being taken seriously in the classroom while studying with men, and feeling like they must work harder to be taken seriously in a male dominated field. This was illustrated through an example provided by a female student who was serving as a teaching assistant. During her time in that role, she sometimes felt undervalued by the other students. While helping a male student, her instructions were ignored until they were repeated by her peer male teaching assistant. Notably, both male and female participants indicated that the aviation industry is moving in a positive direction, increasingly embracing women aviators.

*Theme 6. Access to mentors while in college*

For both male and female participants, college offers more opportunities for mentorship. The majority of participants said they consider their instructors and professors as mentors. For female participants, the college environment presents a more diverse learning environment compared to their precollege experience. Even so, the number of male students is higher than female students in their respective aviation programs.

*Theme 7. Involvement in aviation organizations*

Participation in aviation organizations is one way to find mentors. All participants reported being members of organizations such as Women in Aviation, The 99s, Air Line Pilots Association (ALPA), National Gay Pilots Association (NGPA). Students also participate in local organizations and volunteer at campus aviation events. Participants noted that these organizations provide opportunities to interact with industry professionals. One of the participants, who is a first-generation aviator in his family, said his involvement in students' organizations gave him an opportunity to meet people who are currently doing what he anticipates he will do throughout his career.

**Discussions and Limitations**

To date, numerous studies have explored the lack of all forms of diversity in the aviation and aerospace industry [1][2][7]. However, there has been limited research on exploring the common factors that attract both men and women to aviation careers and unique factors that draw women into the industry. There is also limited research that concurrently addresses more than one aviation discipline as part of the same investigation. In this study, interviews with eight undergraduate students currently enrolled in an aviation program at a university in the Midwest U.S., the authors explored: (1) the underlying motivations driving college students to pursue degrees and careers in aviation, and (2) whether these motivational factors differ between male and female college students when considering an aviation degree or career. The findings indicate that motivation for pursuing aviation as a career varied among participants. However, all participants were mostly driven by personal motivation and a passion for aviation that was nurtured at an early age. Common avenues of exposure to aviation included commercial travel, documentaries, book series, aviation clubs, and ground school classes offered by local airports or flight academies. For individuals who became acquainted with aviation through aviation clubs and flight academies, they were able to find mentors through these programs. Notably, both male and female participants indicated that majority of their precollege mentors were male. For both

male and female participants, college presented more opportunities for mentorship, including participation in aviation organizations and campus aviation events.

While this study has revealed several interesting findings, the study does have limitations. Firstly, this study only interviewed aviation students at one university. It is unknown if these results can be generalized to students in other collegiate aviation programs. Nonetheless, the findings serve as a foundation for future research targeting a broader population of aviation students across various aviation programs in the U.S.

The second limitation of this study is its small sample size, which may impact the generalizability of the findings. However, despite this limitation, the results from this study offer valuable insights into the body of knowledge on diversity in aviation and aerospace education, specifically the motivations for pursuing aviation related careers. Additionally, it is noteworthy that a larger proportion of male students participated in the interview when compared with female students. Nevertheless, this could be attributed to the fact that there are more male students enrolled in the program, thus affecting the representation in the interview sample.

**Conclusion and Future Work**

In conclusion, the study sought to delve into the motivations for pursuing aviation technology degrees and the differences in motivations between male and female students. Researchers interviewed eight undergraduate students in three of the four aviation technology majors at a large Midwestern university. The interview responses were analyzed thematically using qualitative analysis software. Seven themes emerged from the analyses. These are; motivation for pursuing aviation as a career, early exposure to aviation activities, exposure to precollege aviation programs, precollege mentorship and access to role models, awareness of gender issues in aviation, access to mentors while in college and involvement in aviation organizations while in college. The findings show that both female and male participants are motivated by self-drive and a passion for aviation. For both male and female genders, early exposure to aviation activities, such as commercial flying or support from family, played a major role in the decisions to pursue aviation. While male participants were more likely to find male mentors, female participants were unlikely to find female mentors. Female participants found a great community in college where mentors of diverse backgrounds are more common.

Some recommendations for further research emerge from this study. Firstly, a much larger population needs to be studied to comprehend fully the common and unique motivations for both female and male students to pursue aviation degrees and careers. An optimal sampling frame would entail a national sample, encompassing individuals pursuing various aviation majors and representing diverse demographics. Secondly, by gaining insights into these motivations, further studies can be conducted to employ strategies aimed at recruiting and retaining minorities in aviation. For instance, mentorship programs tailored for female collegiate aviation students could be developed to bridge the existing gender gap.

Overall, this study provided insights into some of the motivations for pursuing aviation related careers. In addition, the study contributes to the body of knowledge on diversity in the

male dominated aviation industry. The findings of this study may be used by those aiming to increase recruitment of diverse students into aviation degree programs.

## References


[1] A. Habig and C. K. Marete, "Factors that Influence the Pursuit of Collegiate Aviation Maintenance Degree Programs: The Differences Between Women and Men Students;" *Proceedings of the 2023 American Society for Engineering Education [ASEE] IN-IL Sections.* Edwardsville, IL. 2023

[2] C. K. Marete et al. "A systematic literature review examining the gender gap in collegiate aviation and aerospace education." *Collegiate Aviation Review International, 40*(1), 168-186. DOI: https://doi.org/10.22488/okstate.22.100209. 2022.

[3] S. M. Morrison and A. W. McNair, "Community, coalition building, and career decision-making self-efficacy: a case study of collegiate women in aviation." *Journal of Women and Minorities in Science and Engineering*, *29* (3). 2023.

[4] IATA, "Advancing Diversity, Equity & Inclusion with 25by2025." 2023.

[5] Women in Aviation Advisory Board, "Breaking Barriers for Women in Aviation: Flight Plan for the Future." *In Federal Aviation Administration.* Https://www.faa.gov/regulations_policies/rulemaking/committees/documents/index.cfm/committee/browse/committeeid/817. 2022.

[6] R. Lutte, *Women in Aviation: A Workforce Report 2021 Edition.* Https://www.researchgate.net/publication/357032586_Women_in_Aviation_A_Workforce_Report_2021_Edition. 2021.

[7] C. K. Marete and C. Wang, "Diversity, Equity, and Inclusion: Trends in the Representation of Women Professionals in the Aviation Industry." *Proceedings of the 2024 Transportation Research Board Conference [Poster Session].* Washington DC. 2023.

[8] Bureau of Labour & Statistics. 2023.

[9] D. C. Ison, R. Herron, & L. Weiland, "Two decades of progress for minorities in aviation." *Journal of Aviation Technology and Engineering, 6*(1), 4. 2016.

[10] Lent et al., "Toward a unifying social cognitive theory of career and academic interest, choice, and performance." *Journal of Vocational Behavior, 45*(1), *79–122.* https://doi.org/10.1006/jvbe.1994.1027. 1994

[11] S. L. Anderson and D. J. Pucel, "An investigation into factors influencing men and women in becoming professional pilots." *Journal of Aviation/Aerospace Education & Research, 12*(3), 2. 2003.

[12] Ward et al., "Developing Innovative Strategies for Aviation Education and Participation." *Developing Innovative Strategies for Aviation Education and Participation.* 2019. Pp. 1-7

[13] Boeing. "Pilot Outlook 2023-2042." https://www.boeing.com/commercial/market/pilot-technician-outlook#overview. 2023

[14] Henneberry, Debra, "The Sky's the Limit: Factors That Affect Females' Decisions to Become Professional Pilots". *Education Doctoral.* Paper 393. https://fisherpub.sjf.edu/education_etd/393. 2018

[15] Henneberry, D., Lubner, M., & Russo, P. "An examination of recent female graduates from a collegiate aviation program and their decisions to become professional pilots," *National Training Aircraft Symposium, Embry Riddle Aeronautical University, Daytona Beach.* https://commons.erau.edu/cgi/viewcontent.cgi?article=1343&context=ntas. 2020.

[16] Quimby, J. L., & DeSantis, A. M. "The influence of role models on women's career choices." *Career Development Quarterly, 54*(4), 297-306. 2006

[17] Hamilton, P. R., "The teaching women to fly research project," In D. Bridges, Neal-Smith, & A. J. Mills (Eds.), *Absent aviators: Gender issues in aviation* (pp. 313-331). Farnham, Surrey, UK: Ashgate Publishing Ltd. 2014.

[18] Opengart, R., & Ison, D. "A strategy for alleviating aviation shortages through the recruitment of women." *International Journal of Aviation Management*, *3*(2–3), 200–219. https://doi.org/10.1504/IJAM.2016.079953. 2016

[19] QSR International. Nvivo®. https://help-nv.qsrinternational.com/20/win/Content/about-nvivo/about-nvivo.htm. 2024

[20] Foster, P. M. *Recruiting women and minorities into aviation maintenance*. ProQuest Dissertations Publishing. 2003.

[21] Clark, P. J., Newcomer, J. M., & Jones, A. M., "Overcoming Gender Barriers in Aircraft Maintenance: Women's Perceptions in the United States." *Collegiate Aviation Review*, *33*(2), 66–84. https://doi.org/10.22488/okstate.18.100505. 2018.

[22] Gibson, D. E., "Role models in career development: New directions for theory and research*," Journal of Vocational Behavior, 65*(1), 134-156. 2004.

## Appendix A

## The Role of Education in Attracting Young People as the Next Generation of Aviators: The Differences between Women and Men Students

*Interview Questions*

**Demographics Questions:**

1. Which year are you in?
2. What is your major?
    a. For professional pilots or AET, what license(s) do you hold?
3. What gender do you identify as?
4. What is your ethnicity?

**Awareness and Exposure:**

5. When was the first time you were exposed to aviation?
    a. What was the activity?
    b. How significant was the impact of the activity on your decision to pursue aviation as a career?
    c. Who introduced you to the idea of aviation as a career pathway?
6. Did you have any role models or mentors in the aviation industry during your educational journey prior to college?
7. Did you have any family members that influenced you decision to pursue the aviation industry prior to college?
8. Did anyone (else) inspire your interest in this field or lead to your decision to pursue an aviation career?
9. Were there any programs or initiatives that assisted you in choosing aviation as a career?
10. At what age did you decide to pursue an aviation career?
11. What factors keep you motivated to complete your aviation degree?

**Gender-Specific Motivation:**

12. Did your interest in aviation differ from that of individuals of the opposite gender?
13. Have you encountered any gender-related challenges or barriers while pursuing your aviation technology studies?
14. Have you observed any challenges your peers of the opposite gender faced in this field?
15. Do you think women have to work harder to be accepted by the industry? Do the expectations of women differ from those of men? Is there equal treatment for women in the sector?
16. Do you think there is a lack of representation of women in aviation and aerospace?
    a. If so, does it affect your education and career choice? Why do you think so few women consider aviation and aerospace careers?
17. Have you had access to mentors or role models in the aviation and aerospace industry during your education?

18. Have you joined any organizations or actively participated in activities in the aviation field during your education?
    a. If so, please describe your participation. How do the organization or activities facilitate your education and/or career?

**Appendix B**

Motivation for Pursuing Aviation Technology Careers Codes

| Name | Description | Files | References |
|---|---|---|---|
| Access to mentors in college | Are you currently in a mentorship/ are you aware of mentorship resources? | 8 | 16 |
| Awareness of Gender Imbalance | Are you aware there are gender imbalance in the aviation industry? | 8 | 34 |
| Gender Related Challenges | Are there any gender related challenges? | 8 | 50 |
| Current participation with aviation relater organisations | Are you currently involved with any aviation organisations? | 8 | 17 |
| First exposure to aviation activities | What activities first exposed you to aviation? | 8 | 26 |
| Areas of exposure | What areas/fields of aviation were you exposed to? | 7 | 15 |
| Areas of exposure | what areas/fields of aviation were you exposed to? | 7 | 15 |
| Looked into it myself | I was curious and explored the career options myself. | 6 | 11 |
| Motivation for pursuing aviation | What motivates you to keep going? | 8 | 28 |
| Passion and self-drive | What led you to pursue aviation as a career? | 6 | 8 |
| Precollege aviation Programs | What aviation events/programs did you participate in pre-college? | 8 | 15 |
| Precollege mentorship | Did you have any mentors before starting college? | 8 | 22 |